

The society regrets that owing to unavoidable hindrances many undertakings had to be abandoned. About six pages are devoted to the exploration conducted by Mr. A. V. Zhuravsky of the Bolshezemelsky tundra, starting from the Petshora, and including the river Adzva, the Vashutkin lakes, and the Adak ridge. Samoyed natives assisted as guides. As a result, some important local points were made clear, collections of flora and water fauna, molluscs, and spiders were made, besides a herbarium, map of the lakes and rivers, photographs, meteorological report, and statistics of the native population—which is in danger of dying out—were collected. In the Proceedings of the society, vol. xli., part iii., 1905, Mr. A. Rudneff contributes a preliminary report of this expedition, with illustrations. This region has only been traversed twice previously, by Mr. William Gourdon, of Hull (1614-1615), who left a diary, and by Herr A. Schrenk (1837), author of an account of travel in north-eastern European Russia. Mr. A. V. Zhuravsky's letter to the secretary, in which he relates his activities and mentions the establishment of a zoological station at Ustzilma, appears in vol. xli., part iv.

Mr. A. A. Makarenko made an ethnographical expedition to the Yenesei government, and collected songs and information on local medicine. Other important explorations in Turkestan and the southern steppes are reported. Condensed reports of the ethnographical and other sections, financial statements, publications issued and received, and miscellaneous notes complete the volume.

The Russians have accumulated a vast amount of material with regard to the customs and literature of the Turks and Tartars, the results of researches in fields practically inaccessible to Western scholars.

"The Story of Yedigei and Toktamish," edited by Prof. P. M. Melioransky, consists of a preface, glossary, and nearly forty pages of Kirghiz text (in Arabic characters) of an old tradition concerning some of the leading members of the famous Golden Horde, *temp.* later fourteenth and earlier fifteenth century. Khan Toktamish, after the defeat of the Khan Mamai at Kulikovo-polje by the Grand Duke Dmitri Donskoi, in the following year attacked and burned Moscow. Yedigei was a specially distinguished emir under Toktamish, and, according to the story, was the son of a holy man, Hodzha Amet, and a mysterious, aqueous being with a goat's feet and a transparent body, upon whom her husband does not gaze when she removes a garment for fear she should wish to leave him. Timour or Tamerlane, styled in the story *Sa¹ Temiru*, revered the memory of the Hodzha and protected his son. From being a follower of Toktamish, Yedigei induces Timour to make war on him, and is credited with a similar judgment to that of Solomon in a parallel case of maternal controversy.

The tradition exists among the Nogai, Kirghiz, and Siberian Tartars in varied form. We are not in a position to criticise the text of the poem, and the learned editor hints at a vast wealth of Tartar tradition still to be collected and arranged for publication.

THE MATTEUCCI MEDAL.

THE Italian Society of Sciences known as the Society of the Forty has awarded the Matteucci medal for 1906 to Sir James Dewar in recognition of his scientific work. In presenting the report upon the award, the committee of the society, consisting of Profs. P. Blaserna, A. Righi, and A. Roiti, referred to Sir James Dewar's researches in the following terms:—

James Dewar, born in 1842 at Kincardine-on-Forth in Scotland, completed his studies and took the first steps in his professorial career in the University of Edinburgh; in 1873 he was appointed professor of natural philosophy at Cambridge, from which post he was promoted Fullerian professor in the Royal Institution in London, where he is likewise director of the laboratory founded in memory of Davy and Faraday.

We shall not pause to enumerate all the contributions which he rendered to the knowledge of aromatic compounds, nor the other important investigations in chemistry

¹ *Sa*, it is explained, is a form of the word *Tsar* (Caesar).

by which he initiated his scientific career. But we cannot omit to point out the work which he carried out from 1878 to 1890, for the most part in conjunction with Prof. G. D. Liveing, of Cambridge, which work undoubtedly forms part of the finest that has yet been produced in the field of spectrometry. This work is set out in about fifty short notices free from all preconceived ideas and admirable in their experimental genius, enriched with data meriting the highest attention and universally accepted, and fertile in their theoretic bearing and scope. Dewar and Liveing were the first to investigate the phenomena of inversion in many elements; afterwards they studied the influence of temperature on the spectra of the same elements, and the way in which these spectra were modified by the presence of other elements. Extremely interesting are their researches regarding the various spectra of carbon and its compounds, and in relation to the phenomena of synthesis manifested in the electric arc. They, moreover, furnished the first exact determinations of the ultra-violet spectral region, assigning with the utmost care the wave-lengths for a fair number of elements.

Various other problems made evident Dewar's extraordinary experimental ability, and his world-wide fame was secured by the problem, more than any other, of obtaining extremely low temperatures, to which he has indefatigably and courageously devoted himself for more than twenty years, with the satisfaction of seeing his labours crowned by the liquefaction and solidification of hydrogen, which allowed him to study the chemical and physical properties of gases formerly held to be irreducible, when they have changed their state of aggregation.

Having ingeniously contrived means for rendering inconsiderable the losses by evaporation of these new and highly volatile liquids, and thus for preserving them for a length of time in large quantities, he turned this to able account in order to investigate the very varied phenomena which took place at their boiling temperatures, low in themselves, and still further lowered by expansion.

Most extensive is the field covered by Dewar in his studies of this kind: variations of density and cohesion, chemical and photographic actions, phosphorescence and radio-activity, optical properties, thermoelectricity, electric conductivity and inductivity, and magnetic susceptibility. It would take too long to enumerate here the important and partly unexpected results obtained by him, and indeed it is superfluous, as they are present in the minds of all. Let us rather restrict ourselves to accompanying the Matteucci medal, which we award him, by the wish that from the 13°, which he has already reached, he may descend still further downwards towards absolute zero, and succeed in liquefying even helium.

PRACTICAL METEOROLOGY.

THE Meteorological Committee has issued its first report, for the year ended March 31, 1906. In compliance with the desire expressed by H.M. Treasury, the work of the office proceeds generally on the lines hitherto followed, and the committee record "their appreciation of the services rendered in the administration of the office by Sir R. Strachey, the chairman of the council for twenty-two years," and by other members. An important addition has been made by participation in the investigation of the upper air by means of kites. It is also proposed, if practicable, to make use of unmanned balloons, and to render the service more effective by cooperating with the representatives of other bodies concerned in the work. Among some of the useful researches initiated or completed during the past year may be mentioned (1) the study of the trajectories of air in travelling storms, embodied in an official publication entitled "The Life-history of Surface Air Currents"; (2) re-determination of the velocity equivalents of the Beaufort scale of wind force; (3) connection between the yield of wheat in eastern England and the rainfall of the previous autumn; and (4) possible relationship between exceptional strength of the south-east trade wind at St. Helena and exceptional rainfall in England. Reference to these investigations has already been made in our columns. We note that the payment hitherto made to Dr. Buchan, as inspector of stations in Scotland, is to

be continued for the time being in consideration of his important work in connection with the discussion of the results obtained at the Ben Nevis observatories. The complete or partial success of the weather predictions was very satisfactory during the year in question, e.g. harvest forecasts, 89 per cent.; forecasts appearing in morning newspapers, 88 per cent.; in both cases the best results were obtained in eastern and southern England. The number of storm-warning telegrams justified by subsequent gales or strong winds was 88.4 per cent. The committee points out that the service of storm warnings, which is extremely difficult on account of meteorological reasons, is aggravated by the frequent impossibility of getting telegrams delivered on the day of issue when dispatched in the evening or on Sundays, and it proposes to give this serious matter further consideration in the current year. The ordinary work of the marine and land branches has been much augmented by the reduction and tabulation of the observations of the National Antarctic Expedition and of auxiliary observations made in connection therewith, both at sea and on land, south of 30° S. latitude.

We have been looking rather carefully at the last published meteorological chart of the North Atlantic and Mediterranean for September, prepared by Commander Campbell Hepworth, marine superintendent of the Meteorological Office; one cannot help being struck with the almost crowded amount of information useful and interesting to seamen that it contains. Like its younger sister, the monthly chart for the Indian Ocean, the face is chiefly occupied by roses, showing for areas of 5° of latitude by 5° of longitude the frequency, direction, and average force of the winds; by waved arrows, showing the direction of ocean currents and the maximum and minimum set in twenty-four hours; and by routes recommended for steam and sailing vessels respectively. The regions where fog is most prevalent are also shown, and the icebergs most recently observed along the Transatlantic steamer routes. The most southerly berg reported up to the early part of August was roughly in 45° N. 47° W., and the most easterly in 47° N. 40½° W. On the back of the chart are given, *inter alia*, charts of tidal currents round the British Isles at the successive hours before and after high-water at Dover, and a co-tidal chart by Dr. Berghaus, with a useful explanation by Sir G. H. Darwin. As we are in the season of West India hurricanes, indications of their approach are explained and directions are given as to the most advisable steps to be taken when the centre of such a storm has been located.

The monthly meteorological chart of the North Atlantic for September, published by the Deutsche Seewarte, contains, generally speaking, similar useful information to that issued by the Meteorological Committee. The scale is somewhat larger than that of the English chart, and the wind-stars are printed in blue, the force, according to the Beaufort scale, being represented by feathers on the shafts of the arrows; altogether they form a prominent feature of the chart. The changes in the areas of high and low barometric pressure and other weather conditions shown graphically are also explained concisely in the text. On the back of the chart the true and magnetic bearings for a large number of points on the coasts when two lights or other objects are seen in line from the deck of a vessel afford an easy method of determining the deviation of the ship's compass. There are also small charts showing the mean isobars, isotherms, percentage of frequency of storms and calms for various localities in September, and the annual change in the magnetic declination. These pilot charts, brought as closely as possible up to the date of publication, are of the greatest practical value to seamen.

GEOGRAPHY AT THE BRITISH ASSOCIATION.

IN his presidential address to Section E, Sir George Goldie took the more or less obvious course of reviewing the progress of geography during the quarter of a century that had elapsed since the association last assembled in that city; but while necessarily saying something of the progress of exploration during that interval, he wisely passed rapidly over this side of the subject, and addressed himself chiefly to the wider aspects of the growth of the

scientific treatment of the subject and the spread of the geographical spirit among the people at large. The address was therefore unusually valuable from the point of view of all who are interested in the present position and future of the subject, both as an item in the educational curriculum of the country and as a study of undeniable importance to the general welfare of the nation.

There was a particular fitness in laying stress on this side of the question from the fact that, twenty-five years ago, as Sir George Goldie pointed out, a true conception of the functions and scope of geography was confined to a very limited circle of specialists, so that the progress so far made may be said to belong exclusively to the period under review. The investigation undertaken by the Royal Geographical Society, which was undoubtedly the starting point of any success since achieved, was, in fact, set in motion a few years after the previous York meeting of the association. The report issued by the society as a result of Dr. Keltie's inquiries showed how entirely inadequate were the methods of geographical tuition in those days, and the little importance, with one or two praiseworthy exceptions, attached to it in educational circles. The "absurd prejudice" which, as then pointed out by one of the few more enlightened teachers, regarded the subject as unworthy of the attention of first-rate men, has happily since been to a large extent overcome.

Sir George Goldie aptly diagnosed the source of our weakness as being, not the absence of the necessary raw material, for few countries possessed a literature of travel and exploration so wide and of so high a class as ours, but the paucity of men qualified to apply scientific method to this raw material, and the want of an institution where a thorough training in geography might be obtained. He was able to point to the large measure of success which has attended the efforts of the Royal Geographical Society and its coadjutors to remedy these defects, as evidenced in the present position of geography at Oxford and Cambridge and other of our universities. As a main cause of a spread of interest in the subject among the people at large he assigned the marked re-awakening of the spirit of colonial expansion, from 1884 onwards, and held that "empire-building is an even greater factor than war in advancing and popularising geographical knowledge."

As regards the future, he pointed out that though the popularity of a subject is by no means a test of its place in the ranks of science, the democratisation of geographical ideas is a very hopeful feature, by reason of the widening of the area from which students can be drawn and men of genius evolved. In conclusion, he gave a by no means contemptible list of books and papers as samples of the work recently produced in this country under the stimulus of scientific method applied to geographical study.

Among the papers, discussions, and lectures which formed the remaining programme of the section, one by Mr. G. W. Hope, a young American professor from the Ohio State Normal College, may be first mentioned, on account of the close bearing which it had on the subject of the presidential address. In a valuable and suggestive paper Prof. Hope urged the importance of Social Geography as a subject of study which has hitherto been too much neglected. The paper well exemplified the wide field open to the student of the new geography, and the need that it should be taken up by first-rate men if it is to lead to the most valuable results. The speaker dwelt, for instance, on the wide and thorough knowledge, not merely of geography in its narrower sense, but of allied subjects such as history, technology, and economics, which is indispensable for a fruitful study of the problems of social distribution. His avowal that he had himself approached the subject largely under the inspiration of the geographical movement in this country should give much encouragement to those who have worked so strenuously in its furtherance.

A large part of two mornings was taken up with well-sustained discussions, one on coast erosion, the other on a proposal for improved geodetic measurements in Great Britain. The former was opened by a paper by Mr. Clement Reid, F.R.S., who insisted on the need of approaching the subject with an adequate knowledge of past geological events in order to gain a comprehensive grasp of all the factors. The erosion of our coast must be studied in conjunction with the deposition of the material